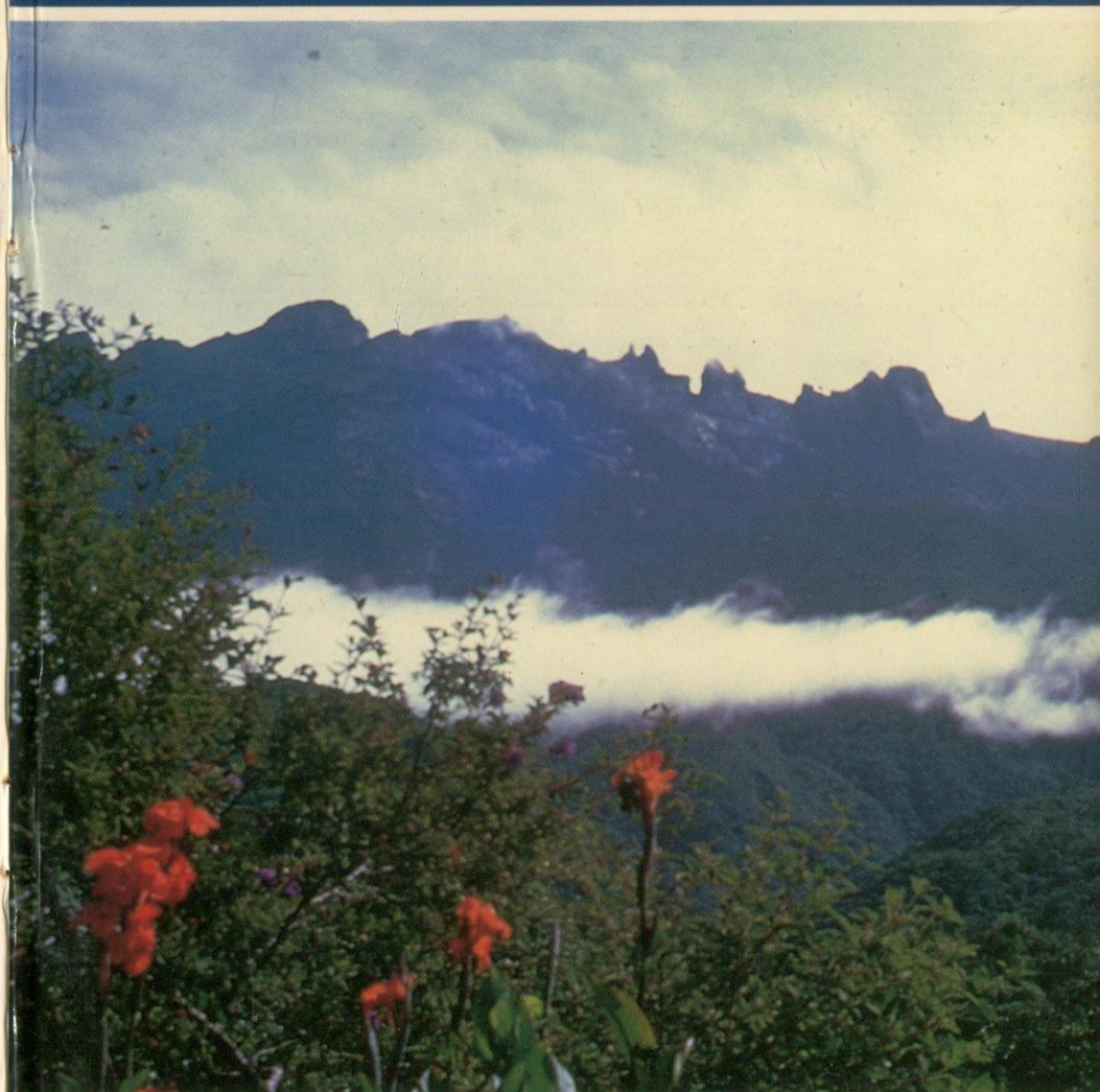


# KINABALU PARK

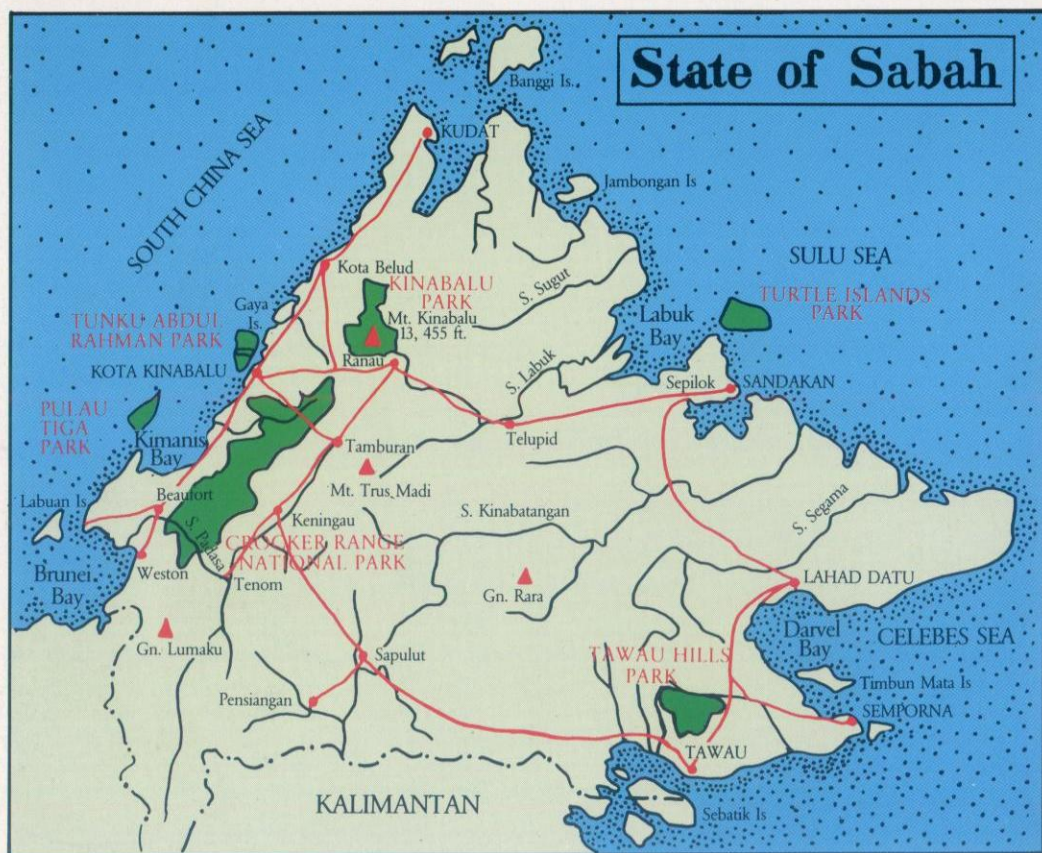


SABAH PARKS PUBLICATION NO. 7



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Map of Parks in Sabah

SABAH PARKS PUBLICATION NO. 7

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# KINABALU PARK

By

*Susan Kay Jacobson*

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SABAH PARKS TRUSTEES



## CONTENTS

	<i>PAGE</i>
I. Introduction	1
II. Legends and People of Mt. Kinabalu	5
III. Geology	9
IV. Plant Life	12
V. Animal Life	30
VI. The Summit Trail	52
VII. Poring Hot Springs	58
VIII. Accommodation	60
IX. Other Places of Interest	64





Plate 1. Mt. Kinabalu

## *I. INTRODUCTION*

Mt. Kinabalu towers 4101 metres (13,455 feet) above the tropical rainforest. It is the highest mountain between the Himalayas and the snow-capped peaks of New Guinea. Ever-changing, it is a mountain of colourful blossoms and golden sunsets, but also of dark and violent storms. At times a ghostly mist shrouds the mountain and it is easy to believe the local Kadazan's claim that it is the homeland of their spirit world.



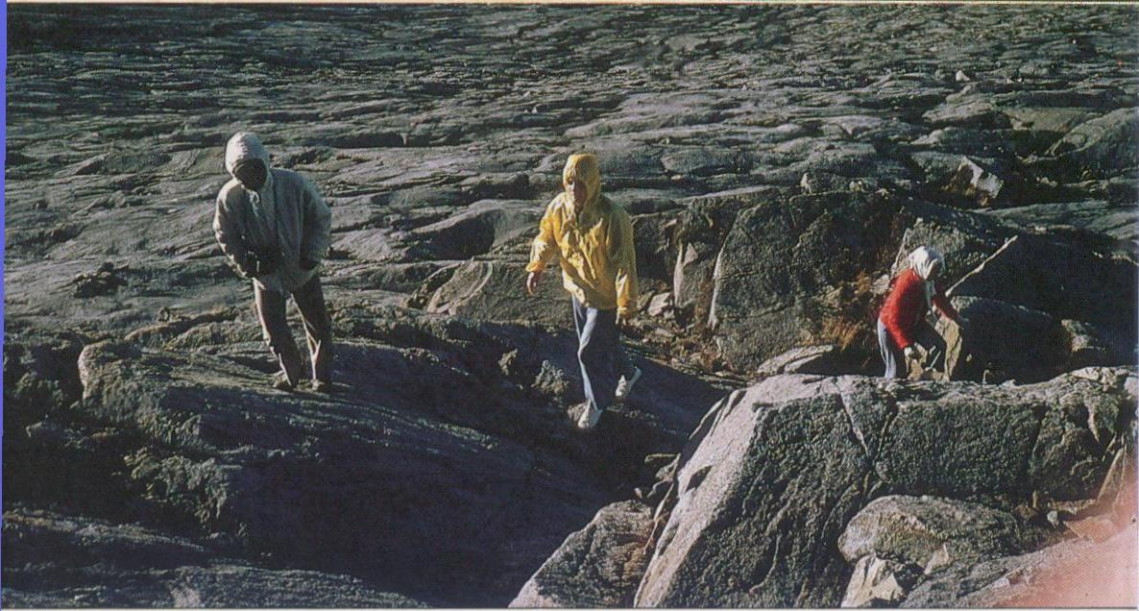


Plate 2a. Hikers on the Summit Trail

In 1964 Kinabalu Park was established to protect Mt. Kinabalu and its extraordinary plant and animal life. Its 754 square kilometre (291 square mile) terrain stretches upward from lowland rainforest to montane forest, cloud forest, and subalpine meadow, before finally reaching a crown of bare granite.

The trail to the highest peak winds along the southern side of the mountain. It is an 8½ kilometre (5¼ mile) trek to the top. In 1985 a Park messenger scaled the mountain and returned to the base in the fastest recorded time: 5 hours, 1 minute, 7 seconds. However, for most people, from a 9 month-old baby (carried by father) to an 83 year-old New Zealander, the journey takes two days. Of course a longer stay is worthwhile to enjoy the unique wildlife and splendid views. For a more leisurely holiday, visitors stroll the 11 kilometres of gently graded trails around Park Headquarters.

On the southeastern side of the Park, hot sulphur baths and a cold water swimming pool have been developed at Poring Hot Springs. Here, too, there are several kilometres of trails and a magnificent waterfall.

The Park Headquarters is located 90 kilometres (56 miles) from Kota Kinabalu, Sabah's capital. Almost half a million visitors have enjoyed the Park since it opened. Of these, about ten percent have successfully reached the summit.



Plate 2b. Successful climbers at Low's Peak





Plate 3a. School programme

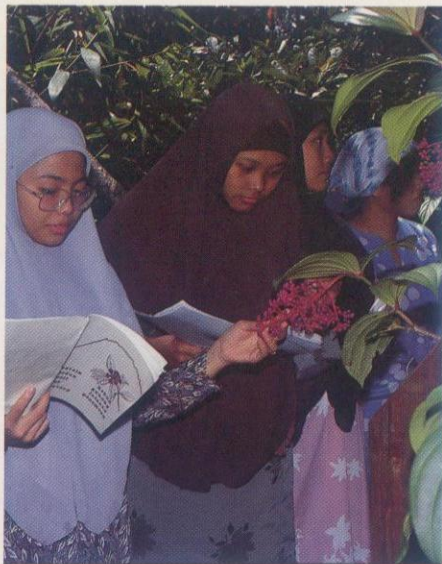


Plate 3b. Visitors in the Mountain Garden

Kinabalu Park provides more than recreation for Sabah. It is also a valuable educational resource. Visitors are treated to slide-shows, guided walks, and exhibits. Special programmes are provided for school children, and a roving Mobile Unit brings film shows to local villages. The Park staff conduct scientific research and maintain an herbarium and Mountain Garden for botanical studies.

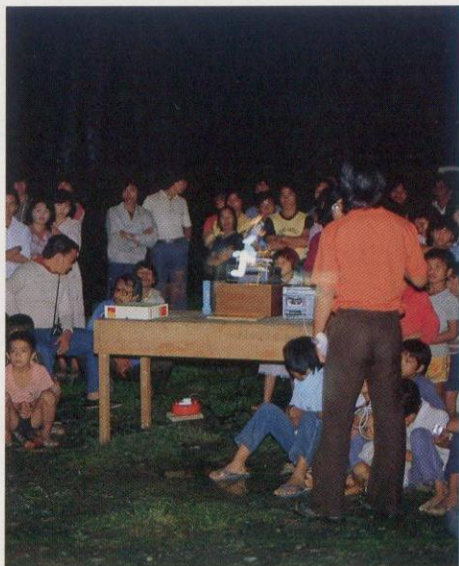


Plate 3c. Mobile Unit visiting a local village



Plate 3d. Park staff conducting research





Plate 4a. Rivers protected by Kinabalu Park provide clean water for irrigation.

Kinabalu is one of six Parks established by the people of Sabah to preserve their natural heritage for present and future generations to enjoy.

The preservation of the Parks' forests and wildlife also results in the valuable protection of western Sabah's watershed. Eight major rivers originate on Mt. Kinabalu and provide many of Sabah's towns with pure water for drinking, fishing, and irrigation.

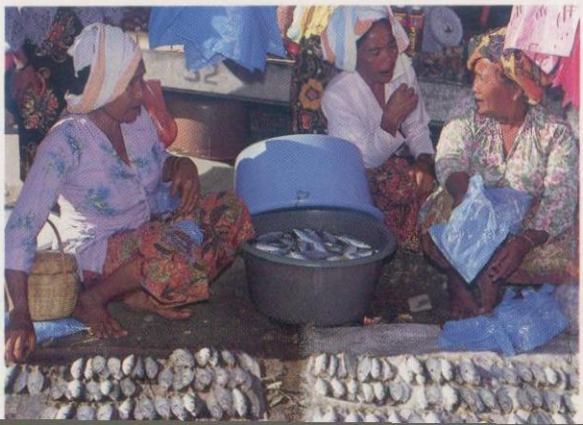


Plate 4b. Fish for sale





Plate 5. Clouds descending on Mt. Kinabalu.

## II. LEGENDS AND PEOPLE OF MT. KINABALU

*"Once upon a time there was a giant living ... at the foot of Mt. Kinabalu."*

— Ansow Gunsalam, 1983

Kinabalu's name is a mystery. The most popular view derives it from the Kadazan words, *Aki Nabalu*, meaning "the revered place of the dead." The local Kadazans believe their spirits dwell on the mountain top. Among the bare rocks of the summit grows a moss which early Kadazan guides said provided food for the spirits of their ancestors.

Another theory about the mountain's name comes from the derivation of *Kina*, meaning "China," and *Balu*, meaning "widow." A Kadazan legend tells the story of a Chinese prince ascending the mountain. He is seeking a huge pearl on the top which is guarded by a ferocious dragon. The prince succeeds in slaying the dragon and stealing the pearl. He then marries a Kadazan woman, but soon abandons her and returns to China. His wife, heartbroken, wanders to the mountain to mourn. There she is turned to stone.





Plate 6. St. John's Peak

As there is no record of local people climbing Mt. Kinabalu, the first honour goes to Sir Hugh Low, a government officer from Labuan, who reached the summit plateau in 1851. He did not scale the tallest peak believing, as he wrote, "the highest point is inaccessible to any but winged animals." But in honour of his journey, this peak, along with a 1½ kilometre (1 mile) deep gully, a pitcher plant, a rhododendron, and a few other organisms, all bear his name.

The custom of leaving a signed and dated letter in a bottle at the top of the mountain gives us a history of the early climbers. In 1858, Sir Hugh Low made a second expedition to Kinabalu with his friend Spencer St. John. St. John describes their adventures in his book, *Life in the Forests of the Far East*. It was not until 1888 that the highest peak was scaled by John Whitehead and his intrepid Kadazan porters. Whitehead also made the first zoological collection of the mountain's unusual animals.

In 1910, Lillian Gibbs, an English botanist, became the first woman to scale Kinabalu's lofty peaks. She collected over a thousand botanical specimens for the British Museum. In the same year, Mt. Kinabalu's first tourist made the ascent, describing his trip as "purely a vacational ramble." Shortly after this, a bull terrier named Wigson gained fame as the first dog to climb the mountain, accompanied by the District Officer from Kota Belud.



Many of the mountain's early explorers reported that their Kadazan guides performed religious ceremonies upon reaching the summit. The ceremonies seem to have become more elaborate as the years passed. Low wrote that his guide carried an assortment of charms, pieces of wood, human teeth, and other paraphernalia weighing three kilograms (seven pounds) up to the summit. Whitehead recorded the slaughter of one white chicken. By 1924, the ceremony expanded to include the sacrifice of seven eggs and seven chickens, accompanied by loud prayers and gunshots. Afterwards, the chickens provided a hearty meal for the guide and porters.

These ceremonies were performed to appease the spirit of the mountain as well as the ancestral spirits who lived there. Nowadays, a ceremony is conducted annually by the Park's Kadazan guides. Seven chickens and eggs, as well as cigars, betel nuts, sirih leaves, lime, and rice are sacrificed, and later enjoyed by the guides.



Plate 7. Sacrifice Pool



Plate 8a. Kadazan women

The Kadazan people, Sabah's largest indigenous community, still live on Mt. Kinabalu's flanks. Traditionally they practised shifting cultivation, chopping down the forest to plant rice along with tapioca, sweet potatoes, sugarcane, and tobacco. More recently, temperate climate vegetables like cabbage, lettuce and asparagus, are harvested in the cooler high elevation areas. Gradually permanent, terraced farm plots are replacing shifting agriculture, helping to slow soil erosion and save what remains of the natural forest. Many Kadazans now work as rangers and guides for the Park.



Plate 8b. Temperate vegetables for sale





Plate 9. Low's Gully

## GEOLOGY

*"That ... thing ... must be near as high as Mount Everest."*

— World War II pilot, quoted by Tom Harrison, 1959

Mt. Kinabalu is split down the middle by a  $1\frac{1}{2}$  kilometre deep gorge. The result is a "U" shape, with the two sides Kinabalu East and Kinabalu West, stretching over a kilometre apart. This led people to assume that the mountain was an old volcano. However, recent evidence proves differently. It reveals Mt. Kinabalu as the youngest granite pluton in the world.

In order to understand the geology of this mountain, we must go back 35 million years when Borneo was submerged beneath the sea. Marine sediments began accumulating where Mt. Kinabalu now stands. Powerful forces of pressure and temperature transformed the ocean mud into layers of rocky sandstone and shale. These were uplifted to form a range of mountains, now the Crocker Range which runs through East Malaysia.

In the Pliocene period, about 15 million years ago, a huge ball of molten rock was forced beneath the Crocker Range. As this rock hardened it formed a granite mound, called a pluton, deep beneath the earth's crust. Only a million years ago this pluton was forced upward through the Crocker Range. The process continues and Mt. Kinabalu, presently 4101 metres (13,455 feet), is still growing half a centimetre ( $\frac{1}{4}$  inch) every year. The sandstone and shale which once covered the granite have eroded away to reveal the underlying rock.





Plate 10. South Peak

As you climb the mountain you can see that the geological story does not end here. During the Pleistocene glaciers covered the summit, altering the topography still more. Glaciation ended only a few thousand years ago and left its mark on the mountain. At 3,300 metres (10,800 feet), particularly behind Paka Cave, you can see where the tip of the glacier pushed many different sized rocks before it, forming a moraine. The jagged peaks of the summit remained above the glacier but ice sheets smoothed over the remainder of this area.

Since then, the effects of chemical weathering, heating, and cooling have also transformed the mountain's surface. The outer shell of granite has split along weak points formed when molten granite solidified next to the old layered rock. Water freezing and melting in the rock cracks has helped to break the outer face down even more. The tiled appearance of the summit results from thin layers of rock flaking off.

The varied forces at work on the mountain have left a summit of bare rock eroded into fantastic chasms and pinnacles. The stark beauty and strength of the peak emanate from the force of its creation.





Plate 11c. Donkey's Ears

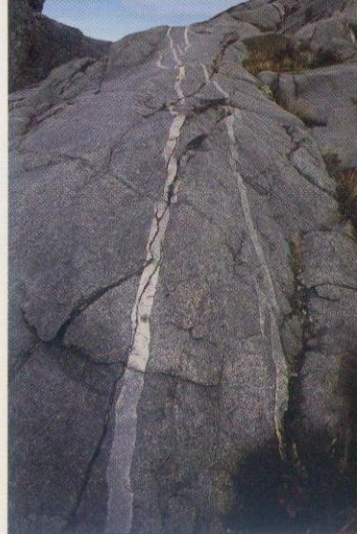


Plate 11b. Aplite (quartz) dyke



Plate 11a. Flaking rocks on the summit.





Plate 12. *Rafflesia pricei*

## IV. PLANT LIFE

*"... to see these plants in all their health and vigour was a sensation I shall never forget - one of those which we experience but rarely in a whole lifetime!"*

— F. W. Burbidge, 1880

Mt. Kinabalu is world famous as a botanical paradise. The climatic changes in the Park as you travel up from 450 to 4101 metres (1500 to 13,455 feet) provide a diverse range of habitats for thousands of plant species. More than half the families of flowering plants in the world are represented on Mt. Kinabalu. Some are related to Australian varieties, others come from Europe and Asia, and others are only found on Borneo. A few have never been discovered outside the Park.

The world's largest flower, *Rafflesia*, blooms in the Park. Its monstrous red blossom can measure a metre (3 feet) across and weigh up to two kilograms (4 pounds). A parasite, it has no leaves. Instead it sucks nourishment from the roots of a forest vine. You can also see one of the world's smallest orchids, *Podochilus*. Its tiny white bloom is barely visible along the mossy trails.



Plate 13b. Phallos fungi

Plate 13a. Fairy clubs



#### *Lower Plants*

The lower plants like fungi, mosses, and ferns, thrive in Mt. Kinabalu's moist climate. Many are still dependent on water for reproduction. Colourful mushrooms, in a variety of shapes, sprout from the forest floor after a rain. Thin orange fungi, whimsically called fairy clubs, beckon like fingers along the trail. Slimy white lobes, called Goat's Eyes, and other fungi masquerading as flower petals decorate the paths. Often they shed their spores and disappear within a day, as mysteriously as they appeared.



Plate 13c. Sunburst fungi





Plate 14. Giant moss (*Dawsonia*)





Mosses and ferns clothe much of the ground, rocks, and trees. The largest moss in the world, *Dawsonia*, towers almost a metre (3 feet) high. Over 450 species of ferns live in the Park. Some are small and delicately laced. Others, like the tree ferns, have four metre (13 feet) long fronds. Look underneath the fern leaves to see the patterns of brown powdery spore bundles. These are shed to form the next generation of ferns.

Plate 15b. Bird's nest fern (*Asplenium nidus*)

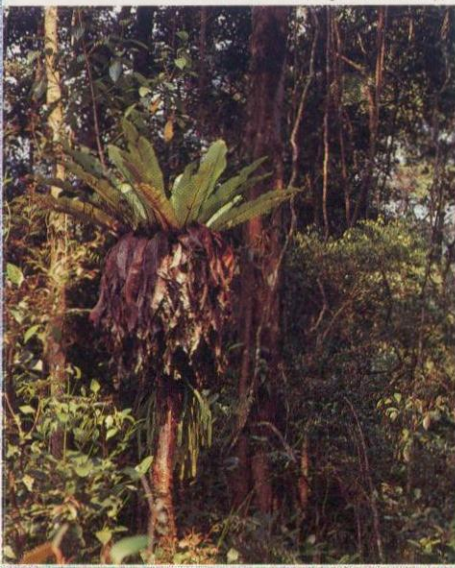


Plate 15c. Tree fern (*Cyathea* Sp.)







Plate 16a. *Spathoglottis microcheilina*



Plate 16b. *Arundina graminifolia*



Plate 16c. *Bulbophyllum lobii*

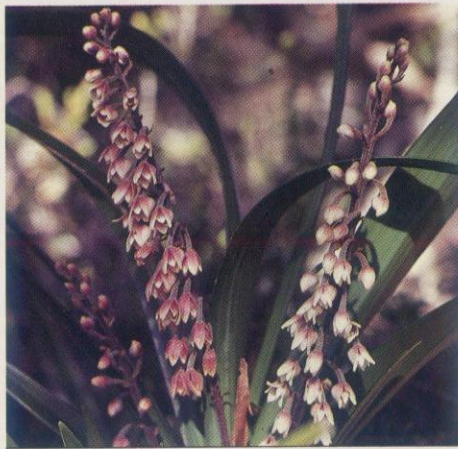


Plate 16d. *Eria* sp.



Plate 16e. *Phalaenopsis amabilis*



Plate 16f. *Spiranthes chinensis*





Plate 17. *Paphiopedilum rothschildianum*

#### *Higher Plants*

Among the flowering plants, you may first be attracted to the thousand species of orchids which inhabit the Park. They display a number of different life-styles. Epiphytic ones cling to trees and sport cascades of lovely blossoms, like some species of *Bulbophyllum*, *Dendrobium*, and *Eria*. Often these have fattened stems or leaves that function as water storage tanks to prevent the plant from drying out. Common ground dwelling orchids around Park headquarters include the showy bamboo orchid, *Arundina*, yellow flowered *Spathoglottis*, and the small, twisted *Spiranthes*.





Plate 18a. *Rhododendron ericoides*



Plate 18b. *Rhododendron suaveolens*



Plate 18c. *Rhododendron brookianum*



Plate 18d. *Rhododendron stenophyllum*



Plate 18e. *Rhododendron abietifolium*



Plate 18f. *Rhododendron rugosum*





Plate 19. Visitor photographing *Rhododendron lowii*

Mt. Kinabalu is also home to 26 species of Rhododendrons. They garland the mountain trails in shades from white to scarlet. The sunshine yellow flowers of *Rhododendron lowii* can be seen between 2700 to 3200 metres (9000 to 10,500 feet). Only a few species can survive the higher altitudes. One of these, *Rhododendron ericoides*, is found nowhere else in the world. With its needle-like leaves and small red flowers, you may not recognize it is in the Rhododendron family.





Plate 20a. *Nepenthes fuscata*

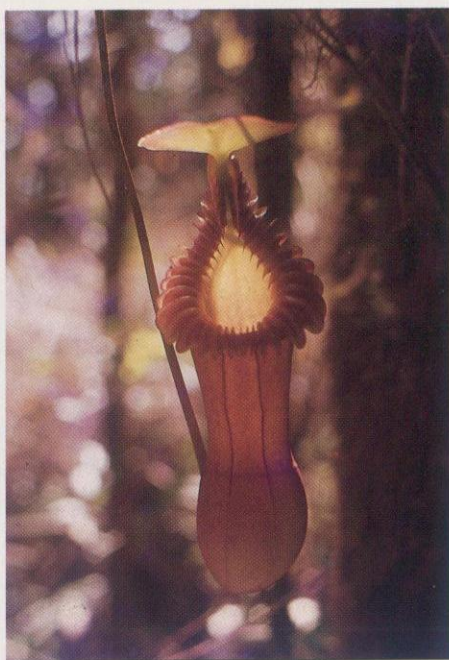


Plate 20b. *Nepenthes edwardsiana*

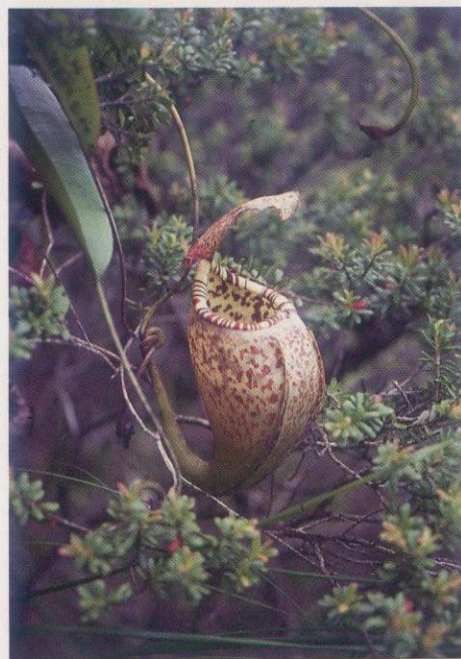


Plate 20c. *Nepenthes burbidgeae*

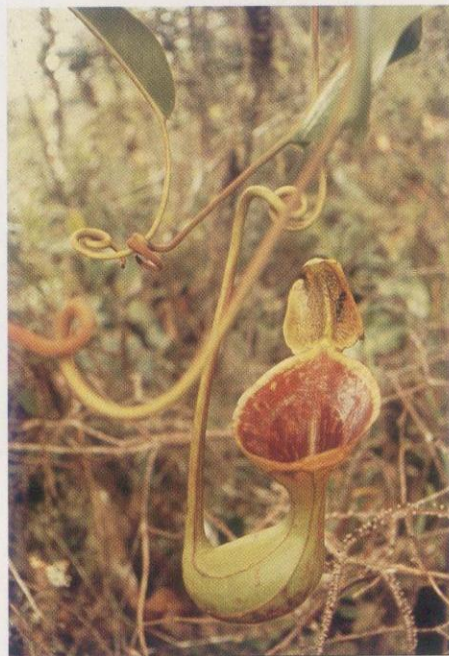


Plate 20d. *Nepenthes lowii*





Plate 21a. *Nepenthes rajah*

Other plants in the Park are famous for their leaves, rather than their flowers. The leaf tips of insect-eating pitcher plants form colourful cups. Nine species of pitcher plants grow on Mt. Kinabalu. The pitchers, flushed maroon and pink, come in a variety of fancy shapes and sizes. Spencer St. John reported finding a pitcher of the largest species, *Nepenthes rajah*, containing 4 litres ( $3\frac{1}{2}$  quarts) of liquid. Another was digesting a drowned rat.

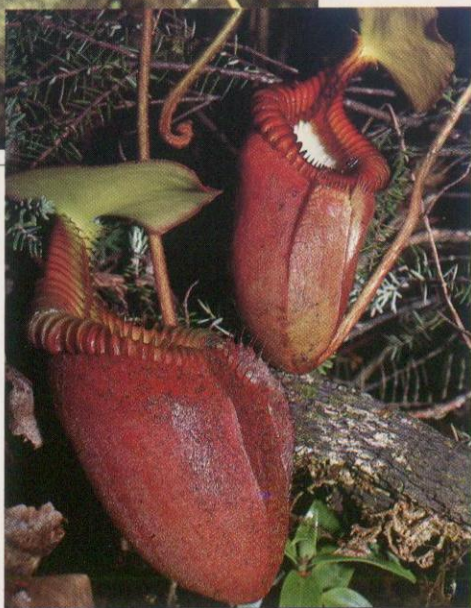


Plate 21b. *Nepenthes villosa*





Plate 22a. Beetle trying to escape from a pitcher.



Plate 22b. Larvae and dead insects in a pitcher.

The hollow cup of the pitcher plant acts like a trap and a stomach. Insects are attracted to nectar secreted from glands near the mouth of the pitcher. Upon entering the cup, they slide down the slippery sides; their escape out is blocked by downward pointing spines. They eventually drown in the slimy ooze at the bottom and are digested. The plant absorbs its lunch through the walls of the leaf. Thus pitcher plants can survive in very poor soil. They rely on nourishment from the insect corpses.

A few specialized insects actually make their home in the pitcher. Some feed on the decomposing insects. Others breed in the fetid pool at the bottom of the pitcher.





Plate 23. Lowland rainforest

#### *Plant Zones*

The variety of plants found in different areas of Mt. Kinabalu is usually dictated by the conditions of climate and soil. Altitudinal zones are used to classify the common plant types of Kinabalu Park.

Up to 1300 metres (4200 feet), lowland rainforest dominates the landscape. Many of the huge trees belong to the Dipterocarp family and are cut for timber outside the Park. There are several layers of foliage beneath the tree canopy. Little sunlight filters down to the forest floor. Lianas and vines climb up the tallest trees in search of light.





Plate 24. Montane Forest

In the Lower Montane Zone, from 1300 to 1800 metres (4200 to 5900 feet), the vegetation changes to Oak-Chestnut forest. Plants more typical of temperate regions are common. You can explore the rich assortment of plants found at this altitude, including over 40 species of Oaks, along the trails at Park Headquarters. Here trees are shorter than in the lowlands and ferns are abundant. One common fern is the broad-leaved *Dipteris* which provides a link from the primitive ferns to the more complex higher plants. Another strange plant is the celery pine, *Phyllocladus hypophyllum*. This is an ancient species that has stems flattened like leaves; the true leaves are reduced to tiny scales. Orange-barked *Tristania* trees stand out from the myriad of other species.





Plate 25a. Broad-leaved fern (*Dipteris conjugata*)



Plate 25b. Acorns from an Oak tree

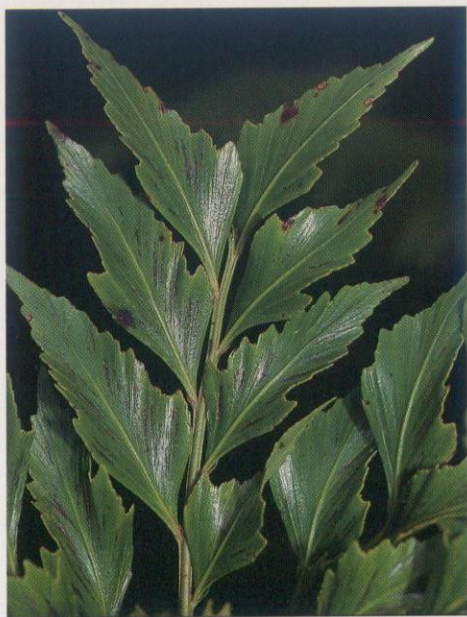


Plate 25c. *Phyllocladus hypophyllus*

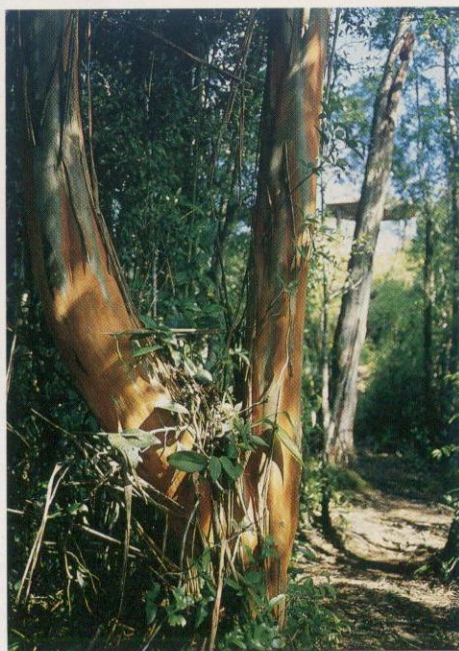


Plate 25d. Peeling bark of a *Tristania* tree



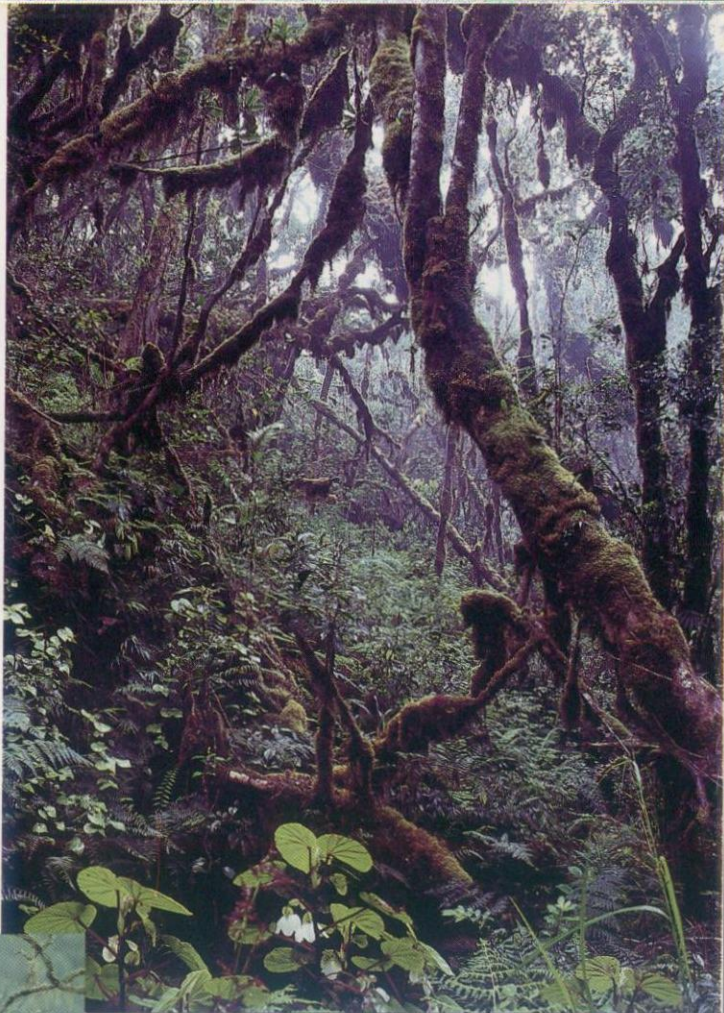


Plate 26a. Cloud Forest

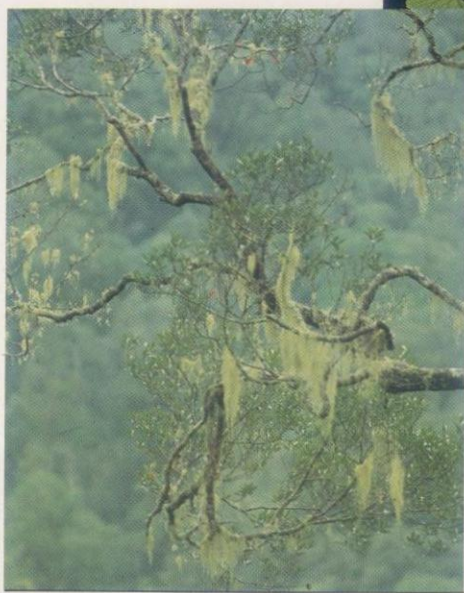


Plate 26b. Hanging lichen (*Usnea* sp.)

As you continue up the mountain, fewer species of plants are able to survive the harsh climate and poor soil. The vegetation of the Upper Montane Zone above 2000 metres (6500 feet) represents a true cloud forest. At this altitude, the mountain is often enveloped in a thick, saturating mist. Mosses coloured gold and green drape the trees. The soil layer thins and trees are stunted, growing only 6 metres (20 feet) tall. Their upper branches are ornamented with pale green *Usnea* lichen. Orchids and rhododendrons grow in profusion. The pink-speckled cups of pitcher plants decorate the edges of the trail. *Nepenthes villosa* with its intricately serrated pitchers is the highest growing member of this family.





Plate 27a. Gnarled trees (*Leptospermum recurvum* and *Dacrydium gibbsiae*)

Above 2600 metres (8500 feet), the strange gnarled forms of *Leptospermum* and *Dacrydium* transform the forest into fairyland. The sparkling white flowers of the shrub *Schima* lie like snowflakes on the pink upper leaves. These trees can tolerate the poor ultrabasic soil that underlies the trail at this point.



Plate 27b. *Schima brevifolia*





Plate 28. Plants growing in the rock cracks on the summit.

The soil disappears above 3300 metres (11,000 feet). The dwarf forest ends where the granite core of the summit begins. Only a few plants can survive the fierce rains, intense sunlight, and ferocious winds of the summit. Club mosses trail along the ground. Sedges, grasses, and the pert yellow flowers of Low's buttercup gain a foothold in the rock cracks. Stunted *Leptospermum* and *Rhododendron ericoides*, only a few centimetres high, grapple for their lives in more sheltered areas.

The last 300 metres (1000 feet) of the summit becomes a moon world of pale grey rock, devoid of any vegetation.



Plate 29a. Low's buttercup (*Ranunculus lowii*)



Plate 29b. *Euphrasia borneensis*

Plate 29c. *Trachymene saniculifolia*







Plate 30. Scaly Anteater (*Manis javanica*)

## V. ANIMAL LIFE

*"During this time we collected some 300 birds, eighteen (species) of which were new to science ... several new mammals, four new reptiles and six new butterflies."*

— John Whitehead, 1893

### *Mammals*

Kinabalu's animal life is as diverse as the plant life, but more difficult to see. Though more than a hundred species of mammals inhabit the Park, it takes patience and luck to glimpse most of them. Many of the mammals dwell in the trees. Others are active only at night. Like the vegetation, the greatest variety of animals is found in the lowland rainforest. Only about ten percent of the mammal species live exclusively in the mountains.





Plate 31a. Bat



Plate 31b. Young Gibbon (*Hylobates*)

The mammals you are most likely to encounter are the squirrels and tree shrews. Like Park visitors, they are active during the day. Over 28 species of squirrels live in the Park. These range from the giant Tufted Ground Squirrel to the tiny 8 centimetre (3 inch) long Pygmy squirrel. At dusk the flying squirrels leap into action, spreading their gliding flaps that billow from wrist to ankle as they soar to a new tree.

The only mammals that truly fly, the bats, also appear as the sun sets. They leave their roosts to swoop after insects or to search for succulent fruit and nectar. The flying fox with its one and a half metre (5 feet) wingspan is the most spectacular of the score of bat species found in the Park.





Plate 32. Orang-utan (*Pongo pygmaeus*)

Best known of the primates in the Park is Borneo's "Man of the Forest," the orang-utan. Adult males weigh over 80 kilograms (175 pounds), almost twice as much as the females, but they are hard to see along the trails. They prefer a lonely life munching on fruits and leaves deep in the forest.

The smaller Borneon Gibbon is also elusive, though you can sometimes hear its whooping territorial calls at dawn around Poring Hot Springs. Two species of Leaf Monkeys are the most visible of the primates in the Park. They can leap up to 6 metres (20 feet) to reach a nearby tree in search of their main food — leaves.





Plate 33a. Slow Loris (*Nycticebus coucang*)

Two distinctive primates, the Slow Loris and Tarsier, can only be seen by investigating the tree tops with a torch after dark. Their big, bulging eyes are well adapted for finding insects and fruits in the blackness of night. They look like animated childrens' toys with their woolly hair and impish expressions. The Kadazan name for the Tarsier, *Tondirukut*, means a collection of things. The collection refers to its strange body with the "tail of a rat, eyes of an owl, feet of a frog, ears of a bat, nose of a squirrel, fur of a loris, and torso of a monkey."

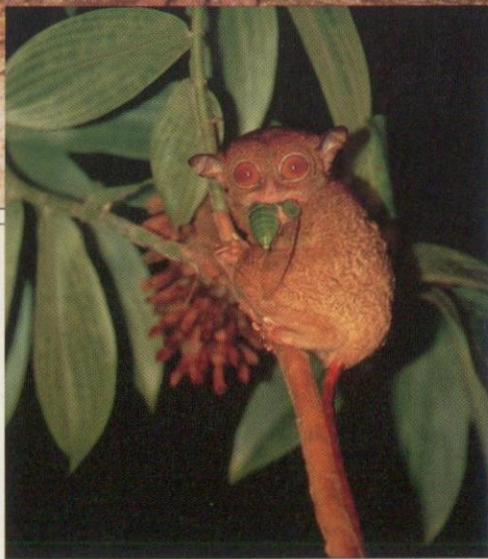


Plate 33b. Tarsier (*Tarsius bancanus*)





Plate 34a. Lesser Mousedeer (*Tragulus napu*)

Other mammals you may encounter along the trails are Mousedeer, Barking deer and Bearded Pigs. These animals provide dinne for carnivores like Clouded Leopards. But the latter are seldom seen. They have secretive habits like the other flesh-eaters found in the Park.



Plate 34b. Sambar Deer (*Cervus unicolor*)





Plate 35a. Bearded Pig (*Sus barbatus*)

Plate 35b. Clouded Leopard (*Neofelis nebulosa*)

Perhaps the only mammals at Kinabalu that welcome human intruders are the 17 species of rats and mice. The Kinabalu Rat, a large relative of the House Rat, lives only on the summit. It frequently visits the mountain cabins.







Plate 36. Scarlet Sunbird (*Aethopyga mystacalis*)

### *Birds*

Over half of Borneo's 518 species of birds have been recorded in Kinabalu Park. These range from Wreathed Hornbills that can pluck fruits with their huge beaks to delicate nectar-sucking sunbirds. Like the plant and mammalian life, you will find the greatest diversity of birds in the lowland forest.

Poring Hot Springs is an ideal place for bird-watching. At dawn, Spiderhunters, Flycatchers, and Flowerpeckers begin their varied occupations as their names describe.

You can often tell what a bird eats by examining its beak. For example, the Serpent Eagle tears meat off its prey with its sharp, hooked beak. In contrast, the sunbird's slender bill is well designed for sliding into long flower tubes in search of nectar.





Plate 37a. Whitehead's Spiderhunter (*Arachmothera juliae*)



Plate 37b. White Crested Hornbill (*Berenicornis comatus*)



Plate 37c. Crested Serpent Eagle (*Spilornis cheela*)





Plate 38b. Grey Drongo (*Dicrurus leucophaeus*)



Plate 38a. Malaysian Treepie (*Dendrocitta occipitalis*)



Plate 38c. Chesnut-crested Babbler chicks (*Yuhimia everetti*)

As you travel to the higher elevation around Park Headquarters, the bird life changes. Malaysian Treepies fly awkwardly from tree to tree. Their tails are 30 centimetres (1 foot) long, a beautiful encumbrance. Graceful Grey Drongos fan their smaller forked tails before swooping after insects. Noisy flocks of Laughing Thrushes chuckle hysterically from the forest. The monotonous "trrr trrr troook" call of Barbets is often heard; yet the songster is seldom seen. Its lime green feathers blend perfectly with the tree foliage.

Several bird species lay their eggs in the mossy banks along the trails. A careful search may reveal a well hidden hole containing three brown speckled eggs (or chicks) in a delicate grass nest.





Plate 39. Mountain Blackeye (*Chlorocharis emiliae*)

As you climb the mountain, the variety of birds decreases. Only a few specialized species live above 2500 metres (8200 feet). Two of these, the Kinabalu Friendly Warbler and a race of the Mountain Blackbird, live only on Mt. Kinabalu and neighbouring Mt. Trusmadi, nowhere else in the world. The Warbler, a drab brown bird, was named for its gregarious personality. Before the Park became so popular, this curious bird would hop around and greet visitors. The handsome Mountain Blackbird with its black body and red breast is a vegetarian. It lays only one egg in its large nest.

Several other birds also live at this high altitude, like the Mountain Bush Warbler and the Mountain Blackeye. The noisy wing beats of the Mountain Blackeye help in identifying this dark green bird. The Mountain Bush Warbler is a brown bird with bone-coloured eyebrows. You will see it creeping cautiously through the undergrowth.





Plate 40. Mountain Water Snake (*Natrix sarawakensis*)

#### *Reptiles*

Few snakes or lizards can survive in the higher altitudes of the Park. These cold-blooded reptiles are more abundant in the steamy lowlands. Yet even there, they are seldom noticed. Many keep secretive habits or are coloured to camouflage with their surroundings. You have to search carefully to spot a lime green whip snake curled on a branch or a brown skink basking in the sun on a brown log. Over a hundred species of snakes and lizards live in the Park. A dozen of these are not found elsewhere.



The snakes range in size from a 20 centimetre (8 inch) burrowing snake, thinner than a fountain pen, to a mighty python that can grow to more than 40 times this length. Some snakes live underground and feed on earthworms and grubs, while others slither above ground or inhabit the trees. There is even a flying snake that glides from tree to tree by spreading its side skin flaps like a parachute.



Plate 41a. Red-necked keel-back snake (*Rhabdophis* sp.)



Plate 41b. Flying snake (*Chrysopelea* sp.)



Plate 41c. Krait (*Bungarus* sp.)



Plate 41d. green whip snake (*Dryophis* sp.)





Plate 42b. Emerald Lizard (*Calotes* sp.)

Plate 42a. Forest Gecko (*Lymnodactylus* sp.)



Plate 42c. Gecko (*Psychozoon rhacophorus*)

The lizards also have a variety of life styles. Some, like the Skinks, search for insects along the forest floor. Others hide in the trees, waiting for nightfall to devour nocturnal creatures. Most easily seen are the Geckos. They keep vigil near the Park lights at night, executing quick dashes to gobble up a tasty moth or beetle attracted by the light. Tiny hook-like cells on their fat toes enable them to cling to ceilings and trees. At Park Headquarters, you may see a species, *Psychozoon rhacophorus*, known only to Mt. Kinabalu. It has a baggy fold of skin along its side and may be a distant relative of the gliding geckos.





Plate 43. Freshwater Turtle (*Pelochelys bibroni*)

Little is known about another group of reptiles in the Park — the turtles. Tortoises roam the trails, but they are easily mistaken for a rock if they retreat into their shells. Freshwater turtles search for fish and frogs in the Park's rivers. Their flattened shells and webbed feet are well designed for swimming.





Plate 44 Sharp-nosed Treefrog (*Rhacophorus acutirostris*)

#### *Amphibians*

The Park's amphibian life is also secretive and new species of frogs are still being discovered. During the day bulging frog eyes peer at you from the many rivers. But you must venture out at night with a torch to see Kinabalu's 45 species. Some are beautifully marked like the yellow, green, and blue rhacophorid treefrogs. Others, like the toads found at higher elevations, are dull and blend well with their surroundings. A master of camouflage, the Horned frog resembles a dead leaf. The strange flaps of skin projecting over its eyes help to complete the image.





Plate 45a. Horned frog (*Megophrys monticola*)



Plate 45b. White-spotted River Frog (*Staurois latopalmatus*)



Plate 45c. Blyth's frog (*Rana blythi*)



Plate 45d. Big-headed Trail Frog (*Leptobrachium cf. hasselti*)



Plate 45e. Tan Treefrog (*Rhacophorus macrotis*)



Plate 45f. Long-legged Frog (*Amolops Sp.*)





Plate 46a. Common Treefrogs mating (*Polypedates leucomystax*)

Almost all frogs return to water to lay eggs. Depending on the species, a dozen to several thousand eggs are laid. Most frog parents just deposit their eggs in the Park's rivers or forest puddles, and leave their survival up to chance. The eggs often become dinner for fish and beetles. In contrast, some treefrog mothers give their eggs more protection by kicking up a frothy nest like a cream pie around the eggs. The eggs hatch into tadpoles, fish-like larvae that breathe through gills. Eventually they change into adult frogs and are able to abandon their watery homes.

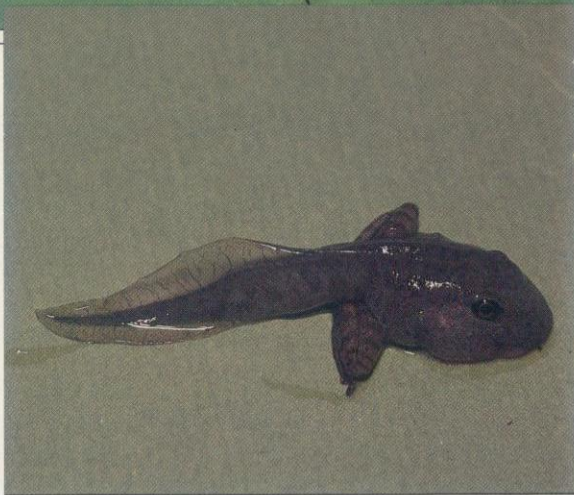


Plate 46b. Tadpole



### *Fish*

Truly aquatic animal life in the Park is represented by over two dozen species of fish. Some are locally valued for their tasty meat. Others have received international attention for their strange habits. Perhaps the most unusual is Borneo's sucker fish, *Gastromyzon*. Its fins and belly have developed into a device for clinging to boulders in swift flowing streams. If you look closely you can see them moving slowly over the rocks. Like underwater cows, they graze on the algae growing there.



Plate 47. Sucker Fish (*Gastromyzon borneensis*)





Plate 48. Female Trilobite Beetle (*Lycidae*)

#### *Insects*

In contrast to many of the Park's larger animals which are shy, the smaller wildlife is abundant and easy to see. The wealth of insect life in the Park's forests is astounding. Thousands of species of beetles, including monstrous black Rhinoceros beetles and beautiful emerald and turquoise Jewel beetles, scavenge on the humid forest floor. Black and orange Trilobite beetles crawl slowly around fallen logs, chewing on the decaying wood. The female Trilobite beetles keep their strange larval shape for life.





Plate 49a. Bush Cricket (*Gryllidae*)

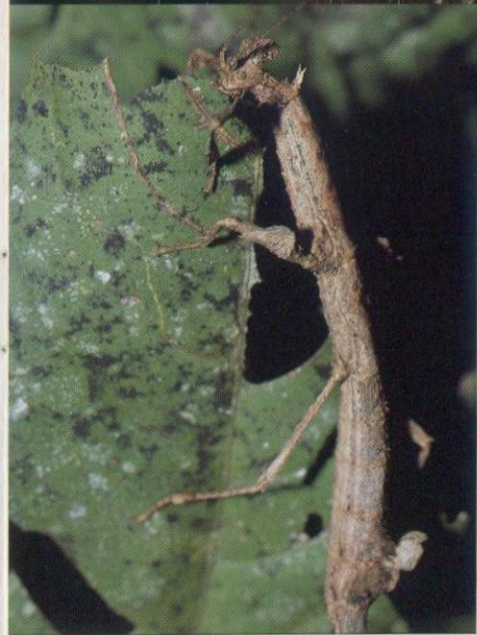


Plate 49b. Stick Insect (*Phenacophorus cornu-cervi*)



Plate 49c. Rhinoceros Beetle (*Chalcosoma mollenkampii*)



A legion of brilliant butterflies flit overhead, every colour of the rainbow reflected in their velvet wings. A chorus of cicadas sings endlessly from the forests during the day. Crickets tune up to continue the whining performance when darkness falls. Evening is also the time to see several hundred species of moths. Giant Atlas moths with 25 centimetre (10 inch) wing spans and tiny moth species, known only from Mt. Kinabalu, congregate around the street lights at Park Headquarters.



Plate 50a. Atlas Moth (*Attacus atlas*)

Plate 50b. *Loepa sikkima*







Plate 51a. Pareronia Butterfly

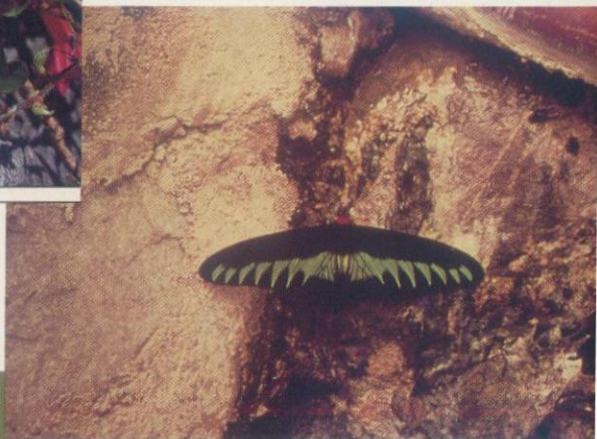


Plate 51b. Rajah Brooke's Birdwing  
(*Troides brookiana*)

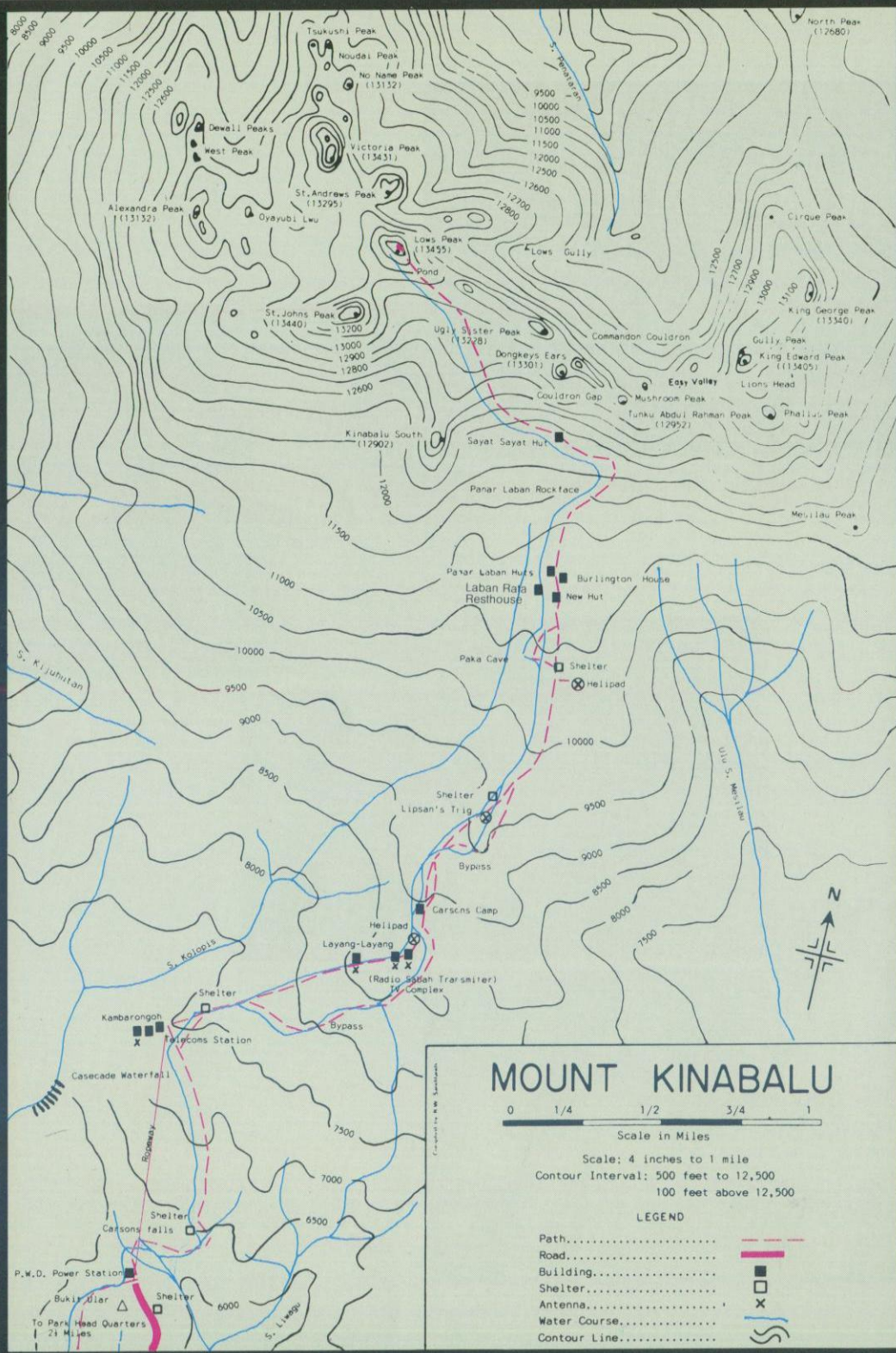


Plate 51c. Appias Butterfly

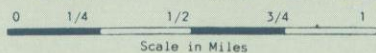


Plate 51d. Autumn Leaf Butterfly





# MOUNT KINABALU



Scale in Miles

Scale: 4 inches to 1 mile

Contour Interval: 500 feet to 12,500

100 feet above 12,500

## LEGEND

Path.....	-----
Road.....	-----
Building.....	■
Shelter.....	□
Antenna.....	X
Water Course.....	~~~~~
Contour Line.....	~~~~~



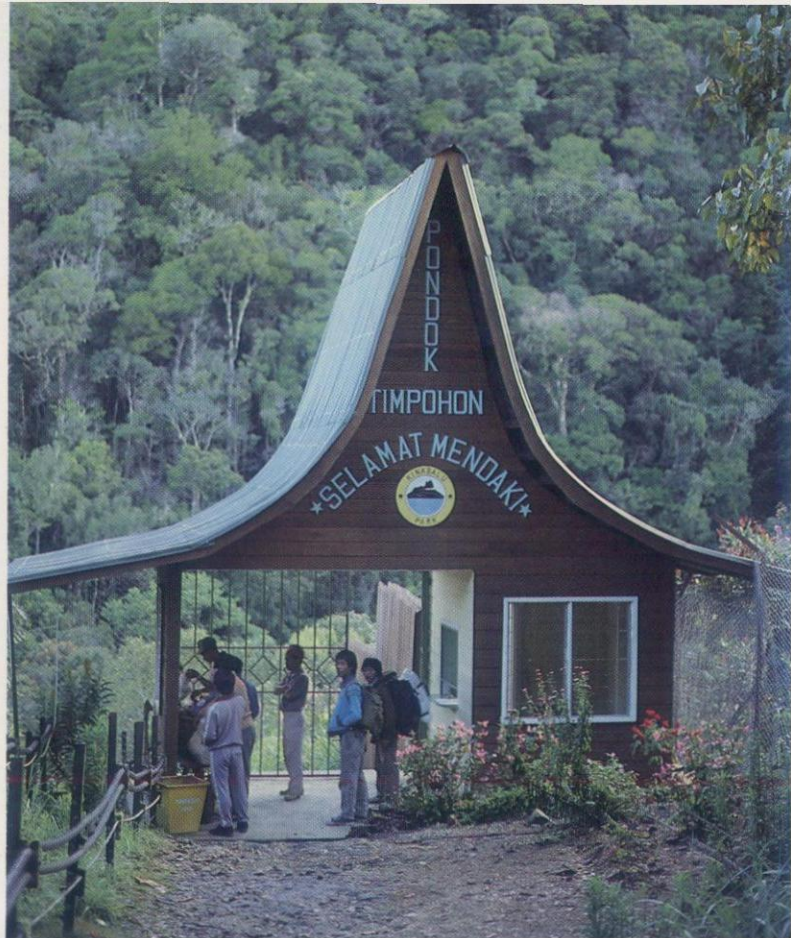


Plate 53. Timpohon Gate

## VI. THE SUMMIT TRAIL

*"It was an eerie and fantastic walk and one to breed wild flights of fancy and dreams*

*..."*

— Oscar Cook, 1927

Only at Mt. Kinabalu can you eat breakfast in a lowland rainforest, lunch in a cloud forest, and enjoy dinner in a subalpine meadow. The trek up Mt. Kinabalu takes at least two days. Remember to bring adequate warm clothing and food. Ice occasionally forms in the summit pools and over 4 metres (16 feet) of rain falls on Mt. Kinabalu each year, so be prepared.

Distances and approximate walking times between the shelters are given below. The trail itself is marked at intervals of 5 chains (50 chains = 1 kilometre, 80 chains = 1 mile). Water is available at every shelter.

There are several ways to travel from Park Headquarters (1554 metres; 5100 feet) to the beginning of the Summit Trail at Timpohon Gate (1830 metres; 6000 feet). A 15 minute drive or an hour's hike along the 4 kilometre (2½ mile) gravel road leads directly to the Gate. An interesting alternative is to stroll the lush Oak forests on the scenic Mempening and Bukit Ular Trails. This takes about three times as long as the road.





Plate 54a. Summit trail at 1900 metres.



Plate 54b. Kinabalu Balsam (*Impatiens platyphylla*)

From Timpohon Gate you hike past Carson's waterfall and a profusion of pink Kinabalu Balsam flowers. It is a steep 25 minute climb to the first shelter, Pondok Kandis, at 1981 metres (6500 feet), and a panoramic view to the Southwest.

Continuing along the Summit Trail for another 15 minutes, you pass Pondok Ubah at 2095 metres (6874 feet). Another 25 minutes will bring you to Pondok Lowi (2286 metres, 7500 feet) on a ridge of the mossy cloud forest. The air is damp. Green moss and ferns carpet the ground and stunted trees.



The trail splits soon afterwards, leading to the Sabah Radio and Television Station, a restricted area on the left, and the continuation of the Summit Trail on the right. The trail winds through the dwarf forest. Clouds often envelop the trees which are festooned with ferns and orchids. After 35 minutes you pass Pondok Mempening (2518 metres, 8262 feet), before arriving at Layang Layang Staff Quarters (2621 metres, 8600 feet) in another 25 minutes. Here wild raspberries and a view to the East make a rest or lunch stop enjoyable.



Plate 55a. Layang Layang Staff Quarters.

Plate 55b. Wild Raspberries (*Rubus* sp.)







Plate 56a. Hikers at 2800 metres

Following the trail you will soon climb over an outcrop of ultrabasic soil. In spite of their stunted appearance, the *Leptospermum* and *Dacrydium* trees may be hundreds of years old here. The pink cups of *Nepenthes villosa*, the highest growing pitcher plant, decorate the sides of the path in this nutrient-poor soil. Mountain Blackeyes search for insects among the *Rhododendron* bushes. From here it is a two hour climb to Paka Cave. You will pass the fifth and sixth shelters at 2842 metres (9500 feet) and 3000 metres (10200 feet) on your way.

Paka cave, a 10 minute detour to the left, is no more than the underside of an enormous granite boulder. But it has historical value as the place where the early explorers passed several damp, cold nights before attempting the summit. The cave is on the bank of the icy Kadamayan River and behind it you can see piles of toppled stones, evidence of a glacial moraine.



Plate 56b. Paka Cave



Plate 57b. Sayat Sayat Mountain Huts.



Forty minutes further along the trail are five mountain huts. The New Hut and Gunting Lagadan Hut, named after the first guide, are the usual overnight stops for climbing parties. At 3352 metres (11,000 feet) you are standing on granite rock, at the edge of the tree line. The magnificent granite peaks of the summit tower above you. Below you the sun sets golden, highlighting the valley in clouds of flaming orange.

Before dawn, you will set out for the peak. A 45 minute walk brings you to Sayat Sayat, named for the *Leptospermum* tree. This is the highest mountain hut at 3810 metres (12,500 feet). The dwarfed vegetation at this altitude contrasts sharply with the enormous silver black dome of the summit.

From Sayat Sayat, it takes an hour to reach Low's Peak. *Leptospermum* roots provide a stairway up the bare granite rock. The scarlet blossoms of *Rhododendron buxifolium* stand out against this stark background. Ropes are attached to the rocks in sheer areas to ease the steep climb.

Perched on Low's Peak, you can watch the sun rise over Borneo. The shining South China Sea comes into view in the West and a 1½ kilometre deep gully plunges to the Northeast. By mid-morning clouds and mist drape the summit and all is lost to view.

Plate 57a. Safety ropes at the summit.







Plate 58a.  
Hot Sulphur baths



Plate 58b. Swimming Pool

## VII. PORING HOT SPRINGS

Poring Hot Springs is located 43 kilometres (27 miles) from Park Headquarters on the southeastern side of the Park. Within a  $1\frac{1}{4}$  hectare (3 acre) area there are 5 hot springs with temperatures ranging from 49° to 60° C. (120° to 140° F.). The steamy sulphur water is channeled into several tiled pools and tubs. These have replaced the original wooden ones installed by the Japanese during wartime occupation.

Soaking in a hot water bath is an ideal way to recuperate from an arduous mountain climb. After a cool dip in the swimming pool you should feel completely refreshed.



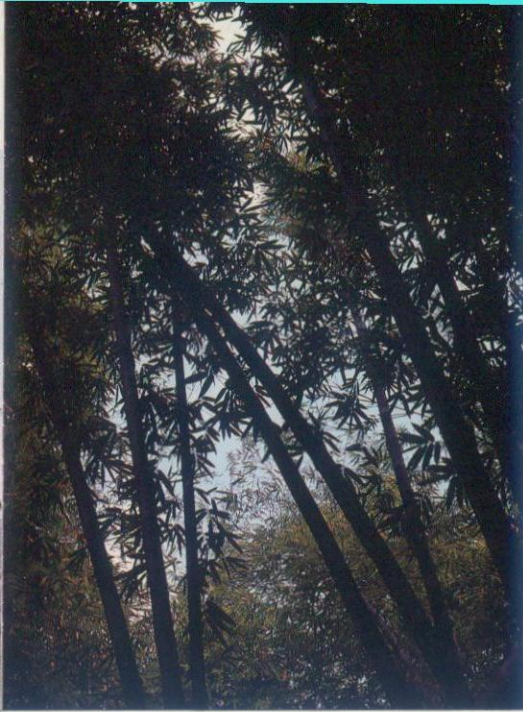


Plate 59a. Bamboo

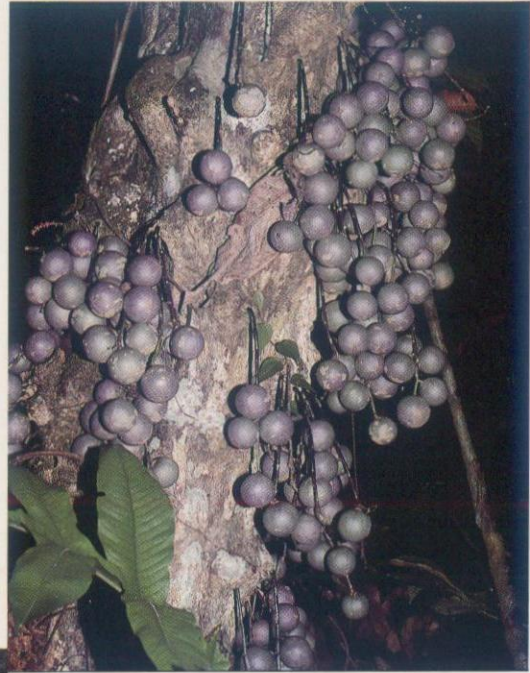
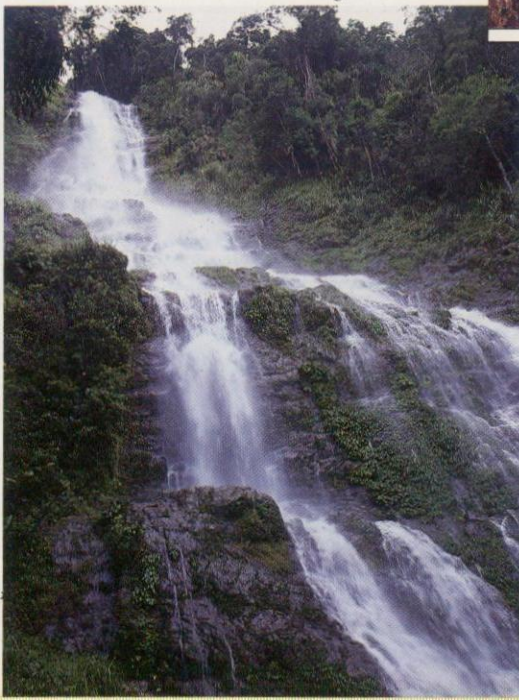


Plate 59b. Wild fruit tree (*Baccaurea* sp.)

Plate 59c. Langanan Waterfall



There are several kilometres of forest trails around the Hot Springs. They lead to plummeting waterfalls and spooky bat caves. Stands of bamboo tower over sections of the trail. The Kadazan name for this giant grass, *poring*, gives the Hot Springs its name. Wild fruit trees like durian, tarap, and mangosteens also grow abundantly.

Wildlife at this low altitude (450 metres, 1500 feet) is very rich. Colourful butterflies visit the abundant flowers around the baths and bright red dragonflies dart after insects. The giant *Rafflesia* flower sometimes blooms by the forest trail.





Plate 60. Administration Building and Restaurant

## VIII. ACCOMMODATION

Overnight facilities are provided at Park Headquarters, Poring Hot Springs, and in Hikers' Huts along Mt. Kinabalu's Summit Trail. You can purchase meals at the Orchid Restaurant and the Kinabalu Club Canteen at Park Headquarters. Most of the accommodations provide kitchen facilities. You must provide your own food at Poring Hot Springs and the Mountain huts.

Reservations and payment for accommodation should be made through the Reservation Clerk, Sabah Parks, P.O. Box 626, Kota Kinabalu, Sabah. The following rates are quoted in Malaysian dollars and are subject to change. A 25 percent discount is given for the cabins on weekdays, other than public and school holidays.

### *Park Headquarters*

### *Rates*

Kinabalu Lodge (8 persons)	— \$360.00 per unit
Double Storey Deluxe Cabin (7 persons)	— \$300.00 per unit
Single Storey Deluxe Cabin (5 persons)	— \$200.00 per unit
Duplex Chalet (6 persons)	— \$200.00 per unit
Annex Suite Rooms (4 persons)	— \$200.00 per unit
Twin Bed Cabin (2 persons)	— \$100.00 per unit
Old Hostel (46 persons)	— \$ 10.00 (adult)
	— \$ 4.00 (student)
New Hostel (52 persons)	— \$ 15.00 (adult)
	— \$ 4.00 (student)
Mountain Huts	— \$ 4.00
Laban Rata Resthouse (11,000 ft.)	— \$ 25.00 per person

### *Poring Hot Springs*

Old Cabin (6 persons)	— \$100.00 per unit
New Cabin (4 persons)	— \$ 80.00 per unit
New Hostel (24 persons)	— \$ 8.00 (adult)
	— \$ 2.00 (student)
Campground	— \$ 2.00 (adult)
	— \$ 1.00 (student)





Plate 61a. Double Storey Cabin



Plate 61b. Deluxe Cabins

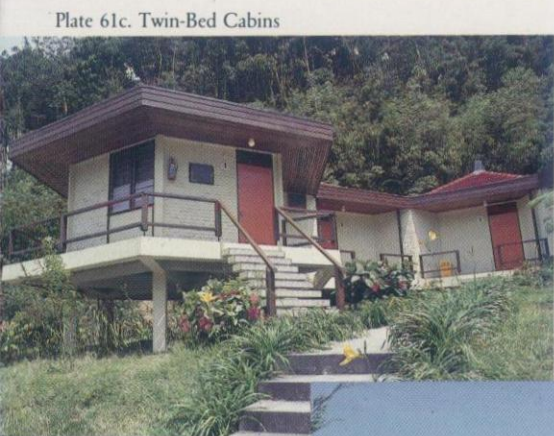


Plate 61c. Twin-Bed Cabins

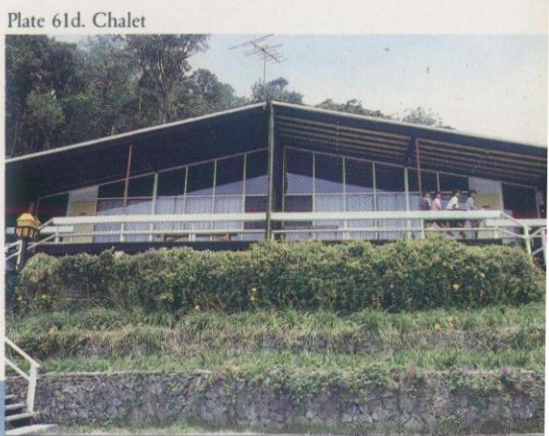


Plate 61d. Chalet

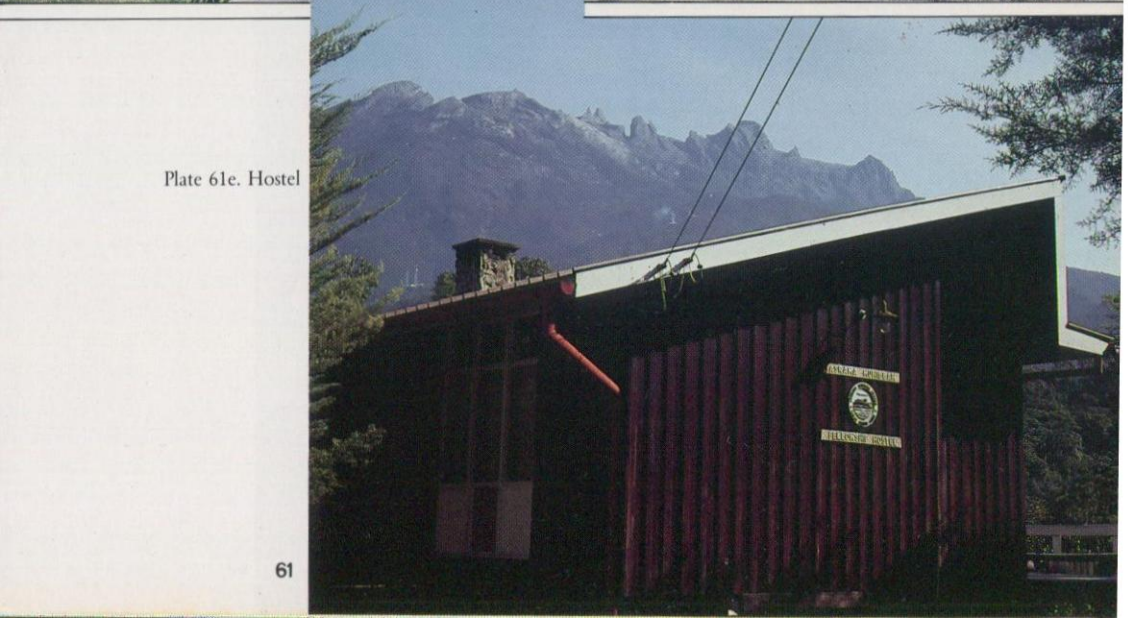


Plate 61e. Hostel



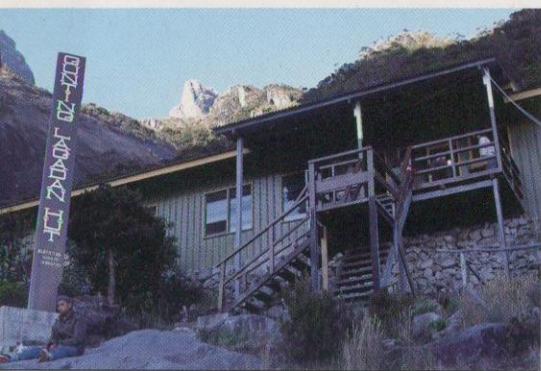


Plate 62a. Gunting Lagadan



Plate 62b. Laban Rata Resthouse

Plate 62d. Hostel, Poring Hot Springs



Plate 62c. Cabin, Poring Hot Springs



Plate 62e. Campground, Poring Hot Springs







Plate 63. Signboard at Kinabalu Park

The wonderful plants and animals of Kinabalu Park weave a unique web of life on this haunting mountain. From the tiny orchid to the towering Oak, all will be preserved for the enjoyment and education of generations to come.

Please help to protect the Park. Regulations have been set forth in the Parks Enactment of 1984 to better preserve the Park and its resources. Collecting of any plants, animals or other living or non-living things is strictly prohibited without prior permission from the Director.

It is forbidden to:

1. Hunt or carry firearms within the Park.
2. Harm or disturb any plant, animal or other living thing.
3. Pick, cut, or take pitcher plants, orchids or any other plants.
4. Write names on rocks or trees.
5. Bring pets into the Park.





Plate 64a. Kundasang War Memorial

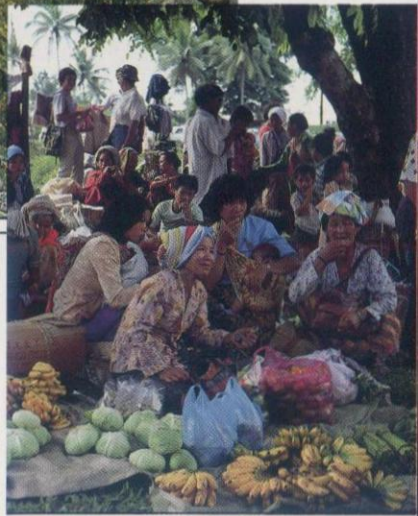


Plate 64b. Ranau Tamu

## IX. OTHER PLACES OF INTEREST

Six kilometres (3½ miles) from Park Headquarters, the Kundasang War Memorial displays gardens from around the world. It is a World War II memorial specifically for men who died in the "Death March." In September, 1944, the Japanese marched 2400 Allied Prisoners of War from the coastal city of Sandakan to the foothills of Mt. Kinabalu. The march took 11 months and only six men survived to tell the tale. The gardens of Britain, Australia, and Borneo are represented at this memorial.

Also in the vicinity of the Park are the Desa Cattle Farm, Mamut Copper Mine, an asparagus farm, and a tea plantation. A monthly market day, called a *Tamu*, is held in nearby Ranau on the first of each month. People travel from their villages to buy and sell exotic fruits and local produce.



## *ACKNOWLEDGEMENTS*

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Readers wishing more information about Mt. Kinabalu should refer to the excellent Sabah Society 1978 Monograph: "Kinabalu Summit of Borneo."

## *PHOTO CREDITS*

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45a, 45b, 45c, 45d, 45e, 45f, 46a, 46b, 47, 48, 49a, 49b, 50a, 50b,

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